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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/617,270
Filing Date: July 10, 2003
Appellant(s): GRADY, MICHAEL CHARLES

MAILED
DEC 28 2007
GROUP 1700

John H. Lamming
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 05, 2007 appealing from the Office action mailed June 23, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

Claims 47-64 were withdrawn from consideration in response to the Election/Restrictions requirement in the final office action mailed on 06/23/2005. The election was made without traverse to prosecute the invention of Group I, claims 1-46.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,171,768	Prentice et al.	12-1992
5,362,826	Berge et al.	11-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-8, 9, 10-12, 16-21, 22, 24-33, 36-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Prentice et al. U.S. Patent 5,171,768.

Independent claim 1 and dependent claims 2-3, 5-8, 9, 10-12, 16-21, 22, 24-31 discloses a process for producing a polymer comprising: conveying hybrid reactor mixtures comprising one or more hybrid reactor monomers and one or more hybrid reactor initiators to one or more hybrid reactors maintained at effective hybrid polymerization temperatures and sub-reflux polymerization gage pressures to cause polymerization of a portion of said hybrid reactor monomers into said polymer; and conveying hybrid reactor contents to one or more batch reactors maintained at effective batch polymerization temperatures and reflux polymerization pressures to cause polymerization of a maintaining portion of said hybrid reactor monomers into said polymer.

Independent claim 32 discloses a process for producing a polymer comprising: conveying a hybrid reactor mixture comprising one or more hybrid reactor monomers and one or more hybrid reactor initiators to a hybrid reactor maintained at an effective hybrid polymerization temperature and sub-reflux polymerization pressure to cause polymerization of substantial amount of said hybrid reactor monomers into said polymer; and conveying hybrid reactor contents to a batch reactor maintained at an effective batch polymerization temperature and reflux polymerization pressure to cause polymerization of remaining amount of said hybrid reactor monomers into said polymer.

Independent claim 33 and dependent claims 36-45 discloses a process for producing a graft copolymer comprising: conveying hybrid reactor mixtures comprising one or more hybrid reactor monomers and one or more hybrid reactor initiators to one or more hybrid reactors maintained at effective hybrid polymerization temperatures and sub-reflux polymerization gage pressures to cause polymerization of said hybrid monomers into macromonomers; conveying hybrid reactor contents to one or more batch reactors maintained at effective batch polymerization temperatures and reflux polymerization pressures; and conveying batch reactor mixtures comprising one or more batch reactor monomers and one or more batch reactor initiators to cause polymerization of said batch reactor monomers into a backbone of said graft copolymer having said macromonomers grafted onto said backbones.

Independent claim 46 discloses a process for producing a polymer blend comprising: conveying hybrid reactor mixtures comprising one or more hybrid reactor monomers and one or more hybrid reactor initiators to one or more hybrid reactors

maintained at effective hybrid polymerization temperatures and sub-reflux polymerization gage pressures to cause polymerization of said hybrid monomers into a hybrid reactor polymer; conveying hybrid reactor contents to one or more batch reactors maintained at effective batch polymerization temperatures and reflux pressures; and conveying batch reactor mixtures comprising one or more batch reactor monomers and one or more batch reactor initiators to cause polymerization of said batch reactor monomers into a reactor polymer to form said polymer blend.

Each Independent claim 1, 32, 33 and 46 discloses substantially the same subject matter.

Prentice discloses a method of producing carboxylated latex composition comprising a step of polymerizing a mixture of monomer(s) and an initiator at a temperature and under constant pressure, column 5, line 24 and column 7, line 55. The latex is prepared by polymerizing at least one conjugated diene, at least one non-carboxylic vinyl aromatic or aliphatic comonomer, and at least one ethylenically unsaturated carboxylic acid monomer, column 1, lines 36-52; column 9, lines 44-55; column 5, lines 67-68 and abstract. The mixture of monomers=reagents is readable for being hybrid reactors monomers in the present claims 1, 25, 32, 33 and 46. The hybrid reactor monomers in the present claim 25 is readable in Prentice invention at column 1, lines 36-52 and column 2, lines 3-67. Free radical initiators such as peroxides are readable in the present claims 1 and 26. In the first polymerization stage the partially polymerized latex of conjugated diene and styrene is polymerized, column 1, lines 51-

52. The partially polymerized latex is readable in applicant's claimed polymerization of a portion of the monomers in a first polymerization zone, for the present claim 1, or the polymerization of substantial amount of said reactor monomers into a polymer in the present claim 32, or the polymerization of hybrid monomers into macromonomers in the present claim 33, or the polymerization of hybrid monomers into a hybrid reactor polymer in the present claim 46. The process is carried out in a batch or semi continuous process, however, due to economic and production reasons the process is preferably carried out on a continuous basis, column 5, lines 11-21. Preferably, the process is carried out in a chain consisting of four continuous stirred-tank reactors, column 5, line 21. The stirred tank reactor is the same that a hybrid reactor or batch reactor in the present claims 1, 9 and 20, since a hybrid reactor is a stirred tank reactor (present claim 9), and a batch reactor is a stirred tank reactor (present claim 20). Prentice discloses a stirred tank reactor at column 5, line 21. The polymerization can be made in the aqueous phase, column 3, line 68, for the aqueous polymerization medium in the present claims 2-3, 5 and 16. The partially polymerized latex is removed from the first reaction zone to the second reaction zone with an addition conjugated diene and an initiator for producing a copolymerized latex, column 6, lines 1-25. The process is preferably carried out on a continuous basis including two or more reaction zones, preferably three or four reaction zones, column 5, lines 11-18. Prentice discloses at least two zones polymerization, for the present claims 1, 33 and 46. At least two polymerization stage in the process for producing latex in Prentice is readable in the present claims. The step of polymerizing a conjugated diene in the presence of partially

polymerizing latex and an initiator is readable in the present claim 33 for producing a graft copolymer. The continuous polymerization process can be carried out in a chain consisting of four continuous stirred-tank reactors connected in series, column 5, lines 20-22; column 6, lines 27-37 and column 7, lines 14-22. A process for producing a polymer blend in the present claim 46 is inherent to the process for producing latex=polymer in the continuous polymerization process in Prentice invention. The process in Prentice invention effects certain polymerization and application properties, column 2, lines 63-65. Prentice discloses that the resulting latex has unique film forming characteristics and polymer morphology, column 1, lines 30-31, for the present claim 30. The film made from the resulting latex has good tensile value and elongation performance for the present claim 30, column 9, Table III and Abstract. The latex contains solids of 49 to 54 percent by weight after polymerization, column 1, line 67. Thus, latex having 49-54 wt.% of solids in water medium and wherein said latex has a film forming performance is equivalent to a coating composition for the present claim 31. The first polymerization zone has a temperature condition in the range of 65 to 85 C, the second reaction zone has a temperature higher for being at 75 to 93 C, column 5, lines 26-29. The temperature polymerization in the first and the second polymerization zones in Prentice invention are readable in the present claims 10 and 21. Because the hybrid polymerization temperature condition in the present claim 10 and the batch polymerization temperature in the present claim 21 can be at least 80 C or in the same range. The process is carried out under constant pressure of 130-210 psig, column 5, line 24; for the present claim 11. In the working example 1 at column 6, a constant

pressure is approximately 45-75 psig. The polymerization pressure condition in the process for producing latex in Prentice invention is overlapping in the range of 0 to 400 psig in the present claim 11. The monomer(s) conversion in to a polymer during the continuous polymerization in each zone is gradually increased from 3 to 12 % to about 70 and 99%. The copolymerization is completed until a final conversion of from about 80 to about 100 % is achieved, column 6, lines 25-35. The term "sub-reflux condition" and "reflux" condition could be the same condition being as an atmospheric pressure, if compare process conditions in the present claim 22 and claim 11. The claimed "sub-reflux condition" in the first polymerization step and a "reflux condition" in the second polymerization stage in the present claims are inherent in the process of producing a latex in Prentice invention because reference discloses the same at least two steps polymerization, the same polymerization conditions, the same reactor and high rate monomer conversion. The polymerization process under temperature and pressure in the stirred-tank reactor includes any available means=devices to control the temperature and pressure in each reaction zone. Thus, a "gage pressure" is also inherent in Prentice invention. It is well known that a pressure is a function of the temperature. Worker in the art knows how to control the pressure and temperature during the polymerization process. The invention as claimed, therefore, is fully anticipated by the disclosure of the Prentice reference.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berge et al U.S. Patent 5,362,826 in view of Prentice et al U.S. Patent 5,171,768.

Berge discloses a method of producing macromonomer composition comprising a step of polymerizing a mixture of monomer(s) and an initiator at a temperature and under nitrogen positive pressure, column 10, lines 34-60 and column 12, line 54, for the present claims 1, 13-14, 32, 33 and 46. A reactor was equipped with a stirrer, thermocouple and condenser, column 12, lines 52-53. This reactor is considered as a stirred-tank reactor, for the present claim 9. The polymerization can be carried out in the presence of a polymerization medium, including organic solvent, column 11, lines 28-30, for the present claims 2-5, 13-15. A chain transfer agent can be employed in the polymerization process, column 9, lines 12 and 47-50 and column 13, line 42, for the present claims 34-35. The cobalt catalyst specified in the present claim 35 is readable in Berg invention, column 13, line 43. The polymerization can be carried out in a batch, semi-batch, continuous or feed process conditions, column 10, lines 56-57, for the present claims. The pressure was applied to avoid monomer reflux, column 11, line 1. The polymerizable monomer such as a methyl methacrylate is readable in the present

claim 25. The step of producing a macromonomer of the polymerized latex is equivalent to a step of making a polymerized portion of monomers into polymer under sub-reflux polymerization conditions in the present claims. Berge also discloses that it is possible to produce terminally functional marcomonomers for producing a higher degree functional terminated polymer, column 11, lines 63-68, for the present claims. Therefore, a second polymerization stage of a process can be applied in Berge 's invention. Berge discloses that polymerization process conditions will depend on a variety of factors, including the selected monomers being polymerized, the particular chain transfer agent, the initiator, the amount of the ingredients, and polymerization conditions such as temperature, pressure and degree of conversion, column 19, lines 45-49. Berge discloses a graft polymer for using in coatings (particularly high performance coatings), column 7, lines 44-45 and 53-54, for the present claims 30-31.

The difference between the present claims and Berge is the requirement in the present claims of a second copolymerization stage to cause polymerization of a remaining portion of monomers from the first stage with said polymer produced in the first stage under reflux conditions.

Prentice reference is discussed above.

It would have been obvious to one of ordinary skill in the art to modify the process of producing macromonomer composition in Berge invention by a continuous polymerization of said macromonomer with addition monomer(s) in the second polymerization stage as disclosed by Prentice because any additional functional

monomer is expected by Berge, column 11, lines 65-68, and, thereby, obtain the claimed requirement.

(10) Response to Argument

Appellant's argument is that Prentice discloses a "pre-polymerization" (page 4) in a first stage of monomers to form an emulsion of the low concentration of latex having 3% to 12% of conversion of monomers to form a partially polymerized latex, column 1, lines 27 and 51-52. The present invention requires a polymer.

There is no average molecular weight for a polymer in the present claims. The definition of term "said polymer" such as microgel or oligomer in the present claims 29, or a macromonomer in the present claim 33 is within the scope for being a latex having any degree of monomer conversion. The desirability of high conversion of monomers into a polymer in the current application (page 8) is not claimed. The term "said polymer" in the first polymerization stage in the present claim 1 and claim 32 are referring to the same "said polymer" that can be microgel or oligomer in the present claim 29. There is no definition of the resulting polymer produced in the second polymerization stage. Claimed "sub-reflux condition" for hybrid polymerization and a "reflux condition" for a batch polymerization can be under the same polymerization conditions. The hybrid reactor and a batch reactor are the same stirred tank reactor having the same type of equipments. A polymerization medium is not claimed in any stage in each independent claim. A hybrid polymerization condition at a temperature of 80 C (claim 10) may require a polymerization medium. A hybrid polymerization condition at 400 C is a melt polymerization for producing a polymer.

Prentice discloses a process for producing a latex having film forming characteristics and polymer morphology, column 1, lines 29-31. The resulting latex having 95% monomers conversion and having polymer morphology is a polymer in the present claims. Prentice discloses a process for producing a latex having a high solid content and having unique film forming characteristics.

The aqueous medium is disclosed in Prentice, Table I and Table II.

The stirred-tank reactor in Prentice invention, column 5, line 21, is equivalent to a stirred reactor in the present claims.

Appellant's argument is that Prentice discloses a degree of monomers conversion in a first polymerization stage of from about 3 to 12%, column 5, line 63. The monomers polymerized in hybrid reactors in the present claim 12 require ranges from 30 to 99 wt.% (page 9). This argument is not persuasive because a first polymerization stage in the present claims may include "one or more hybrid reactors" (present claim 1, line 3; claim 33, line 3; claim 46, line 3). Therefore, the hybrid polymerization can include more than one hybrid reactor. Prentice discloses a continuous polymerization until a conversion to about 99 % is achieved, column 6, line 26. Prentice discloses four continuous stirred-tank reactors, column 5, line 21.

Appellant's argument that the present invention requires at least one monomer and at least one initiator, with at least one solvent component (page 10) is not persuasive. The phrase "one or more hybrid reactor monomers" can include more than one monomer depending on the desired application properties. The term "hybrid" by itself may include at least two monomers. The monomers for producing latex in Prentice invention are readable in the present claims.

Appellant's argument about the temperature and pressure safely operate in the present polymerization process condition (page 12) is within the scope in a

polymerization process in Prentice invention. Prentice discloses the first zone polymerization is maintained at 65 to 85 C, and the second, third and fourth zone at 75 to 93C under constant pressure of 130-210 psig, column 5, lines 24-29. These parameters are readable in the present claims 10-11, 21-22. Any controlling device and monitoring to control pressure is inherent since Prentice discloses the same stirred-tank reactor.

Appellant's argument than Berge discloses a difference chain transfer agent is not persuasive because Berge disclose the same diaquobis(borondifluorodiphenyl-glyoximato)cobalte (II), column 13, lines 2 and 42, for the present claim 35. The polymerization conditions under temperature at 20 to 200 and under pressure, column 10, line 39 and 68 are readable in the present claims. Berge discloses a wide variety of monomers can be polymerized for obtaining the desired macromonomer product, column 11, lines 45-48.

Appellant argues that Berge does not teach proper pressure and temperature to control polymerization process in two stages (page 15), and there is no motivation to combine the teachings of Berge with Prentice. The continuous polymerization stage is expected in Berge invention to modify the macromonomer product, column 11, lines 62-68. It is reasonable to modify the process for producing a macromonomer product by a continuous polymerization of said macromonomer with addition monomer(s) in the second polymerization stage as disclosed by Prentice.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

O. A.
O. Asinovsky

December 20, 2007

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